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U. S. Department of Agriculture

CANNING CROPS, HOME SIRUP MAKING, AND THE CHEMIST

A radio talk by Dr. Henry G. Knight, Chief, Bureau of Chemistry and Soils, to be delivered in the Department of Agriculture period, National Farm and Home Hour, Friday, October 14, 1932, by a network of 47 associate NBC radio stations.

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SALISBURY:

After an absence of a week from the Farm and Home Hour program, Dr. Henry G. Knight, the Chief of the Bureau of Chemistry and Soils in the Department of Agriculture, returns to the microphone today to give us the fifth talk in his series of reports on the practical application of chemical research results to methods of producing and marketing the chief farm products of the United States.

Today he is going to tell us two stories. He will relate the progress of chemical research on the problems of the canning industry and also on the problems of farm manufacture of sirup from sugar cane and sorghum.

When the latest census was taken, the food canning industries were turning out products valued at over half a billion dollars a year and using the produce of hundreds of thousands of farmers. The importance of chemical research on the best methods of processing these products is easily apparent. Chemical research is also highly important to the farmers of the South and Central States who increased the returns from growing sugar cane and sorghum by extracting the juice of these plants and making sirup on the farm. Farmers produce from 30 to 40 million gallons of these sirups each year. They have about 10 million dollars invested in the equipment for making the sirups, and even at last year's low prices, their product was worth 15 million dollars at the farm.

All right, Dr. Knight, we're ready for your stories of the recent results of chemical research on commercial canning methods and on methods of making sirup on the farm.

KNIGHT:

Thank you, Salisbury.

I'm glad to visit again with you people of the Farm and Home Hour audience. I shall not have much time to cover the wide range of chemical research that we are doing and have been doing on problems of the canning industry and of the farm manufacture of sirups. If any of you people want more facts about our results than I can give you in my talk today, I invite you to write and ask me for them.

It goes without saying that chemical research has played an important part in bringing about a seven-fold increase in the value of canned products in the past 25 years. Government chemists and chemists of the industry have worked hand in hand. They have gained exact knowledge about how much heat to apply in processing different foods and how long to apply it. The chemists had to experiment extensively to find out just what temperatures would kill the organisms that might cause spoilage of the canned product; to find out the relationship between

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the acidity of the raw materials and the time and intensity of heating. They have been successful and the men who run canning factories no longer have to depend on guess work. They use exact, scientific methods.

As the chemists and bacteriologists have solved these problems of the industry, they have also met and overcome other difficulties. For instance, chemists have found out how to keep the berry fruits from bleaching after they are canned and how to keep the non-acid vegetables such as corn from becoming discolored while standing in the can. They have overcome both of these problems by developing enamels for the inside of the containers that have protected the fruits and vegetables from the color changes brought about by products of the chemical reactions between the metals in the cans and some of the constituents of the food. The home economists have been telling you about the R enamel cans for use in home canning of red fruits, and the C enamel cans for use in home canning of such vegetables as sweet corn, green peas, and lima beans. You see, our work on this problem has helped both commercial and home canners.

Chemistry has also solved many other problems of the composition of the metal containers for canning foods. In fact, research has been applied to all stages of processing foods in the canning industry. This industry is an outstanding illustration of the indispensable part that painstaking research plays in our modern civilization.

In the past 10 years chemists have given a great deal of their attention to finding out exactly what effect the canning process has on the vitamin content of foods. Very careful research has shown that neither the canning operation nor subsequent storage destroys the vitamin content of canned foods. Our chemists have made extensive studies of the influence of canning operations on vitamins A, B and C. They have found that vitamins A and B are appreciably affected by the canning process. Also that commercial canning does not destroy or injure vitamin C as much as the operation of cooking the raw fruits and vegetables in an open vessel on your kitchen range. The reason for this is that the oxygen in the air rather than heat destroys vitamin C. Canned foods are processed after the air has been largely removed and the can sealed, therefore less oxygen comes in contact with the foods in the canning process than in the process of cooking in an open vessel.

Well, so much for the recent results of our research on the problems of the canning industry. Now I will give you just a brief report on the investigations into the problems of home manufacture of sugar cane and sorghum sirups. These sirups are an important cash crop on many thousands of small farms, especially in the South. The farmers who turn their sugar cane or sorghum into sirup of good quality get considerably more for their crop than they would if they sold the cane from the fields. But unless these men are able to make sirup of good quality they can't get much for it. Their product has to compete with the product of commercial sirup packers. And if it doesn't come up in quality to the commercial product, it naturally sells at a heavy discount.

Our chemists have been trying to devise methods of farm sirup manufacture that will enable the farmers to overcome the 5 main causes of poor quality in farm made sirups. These 5 causes are: First, turbidity and sediment of sirups; second, "sugaring" or crystallization of the sirups; third, fermentation; fourth, poor flavor and too dark a color; fifth, "jellying" (and this, by the way, is a defect of sorghum sirup only).

Our chemists have developed means for controlling or preventing all of these defects of farm made sirup. This is really a signal accomplishment. I shall not go into a detailed description of the methods. Those of you who want to apply the methods undoubtedly want to have them before you in written form so that you will be sure to use them correctly in every detail. Let me again invite any of you who want information on these points to write me.

Our bureau is trying to give small farmers the benefit of our scientific developments in the production of sirups that will meet consumer demand and thus bring higher prices than the low quality sirups that so often result from farm manufacture.

Next Friday my report to you will give the results of research on products made from wheat. Until next Friday, good-bye.

SALISBURY:

Thank you very much, Dr. Knight. And Farm and Home Folks, let me repeat for any of you who want technical information on the details of modern methods of manufacturing good quality farm sirups to send your requests to Dr. Henry G. Knight, Chief, Bureau of Chemistry and Soils, U. S. Department of Agriculture.

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